



SPECIFICATIONS FOR
MODEL GPL+GLG ELECTRIC PUMP CONTROLLER
LIMITED SERVICE FULL VOLTAGE ACROSS THE LINE STARTER
AND AUTOMATIC POWER TRANSFER SWITCH CONNECTED TO A
GENERATOR EMERGENCY POWER SOURCE
MICRO-PROCESSOR BASED

APPROVAL AND LISTING

The electric pump controller and automatic power transfer switch shall meet the latest NFPA 20, be listed with cULus (UL218) and, if applicable, by the City of New York for fire pump service.

STARTING METHOD AND AUTOMATIC POWER TRANSFER SWITCH

The electric pump controller and automatic power transfer switch shall be manufactured by Tornatech and shall be a model GPL+GLG limited service combined manual and automatic type suitable for full voltage across the line starting of the electric pump motor. The automatic power transfer switch shall be housed in its own compartment with its own door and be mechanically attached to the GPL electric pump controller and be suitable for connecting to an alternate power source from a generator whose capacity does not exceed 225 percent of the motor's full load amperage.

SHORT CIRCUIT WITHSTAND RATING

The short circuit withstand rating of the electric pump controller only shall be:

- | | |
|--|--|
| <input type="checkbox"/> 25 kA. RMS at 200 - 240V. (standard) or | <input type="checkbox"/> 18 kA. RMS at 600V. (standard) or |
| <input type="checkbox"/> 65 kA. RMS at 380 - 480V. (optional) | <input type="checkbox"/> 25 kA. RMS at 600V (optional) |

ENCLOSURE

The standard enclosure shall be a double door NEMA/UL/CSA type 2 or optional

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|--|--|
| <input type="checkbox"/> NEMA/UL/CSA type 3R | <input type="checkbox"/> NEMA/UL/CSA type 4X |
| <input type="checkbox"/> NEMA/UL/CSA type 4 | <input type="checkbox"/> NEMA/UL/CSA type 12 |

POWER CIRCUIT COMPONENTS

The electric pump controller and automatic power transfer switch shall be supplied with the following power components:

- Voltage surge arrestor
- One thermo-magnetic circuit breaker for normal power rated at a minimum of not less than 150% of the full load motor current to provide locked rotor, over current and short circuit protection
- One molded case isolating switch for alternate (emergency) power rated at a minimum of not less than 115% of the full load motor current.
- One automatic power transfer switch mechanically held and electrically operated. Manual operation of the transfer switch shall be provided by means of manual operating handle.
- An across the line electric motor starter

OPERATIONAL COMPONENTS

The electric pump controller and automatic power transfer switch shall be supplied with the following externally flange mounted components approved to match the NEMA rating of the enclosure:

- One operating handle for the normal power thermo-magnetic circuit breaker mechanically interlocked with the normal power side enclosure door to prohibit access to the interior in the "ON" position. The handle shall have a hidden interlock defeater and be lockable in the "OFF" position.
- One operating handle for the alternate (emergency) power molded case isolating switch mechanically interlocked with the alternate (emergency) power side enclosure door to prohibit access to the interior in the "ON" position. The handle shall have a hidden interlock defeater and be lockable in the "OFF" position.
- One pump "START" pushbutton
- One pump "STOP" pushbutton
- One "EMERGENCY" start and run handle mechanism latchable in the "ON" position
- One alarm bell energized when the isolating switch is left in the "OFF" position
- Transfer switch test pushbutton

DIGITAL ANNUNCIATOR INTERFACE

The electric pump controller and automatic power transfer switch shall be supplied with two (2) digital annunciator interfaces completely accessible without having to open the controller door. The normal power digital annunciator interface shall be comprised of a 4-line, 20-character and a separate 2-line 20-character continuously back lit digital display screens, keypad type pushbuttons, high luminosity LED's and have the same NEMA rated degree of protection as the enclosure of the electric pump controller and automatic power transfer switch. The normal power digital annunciator interface shall numerically display:

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|--|------------------------------|
| • Normal power source individual phase to phase incoming voltage and frequency | • True pump elapsed run time |
| • Individual phase motor current | • Pump start counts |
| | • Time and date |



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- Cut-In and Cut-Out pressure settings
- System pressure
- Minimum run period timer
- Sequential start timer
- Weekly test timer

The alternate (emergency) power digital annunciator interface shall be comprised of a 4-line, 20-character continuously back lit digital display screen, keypad type pushbuttons and have the same NEMA rated degree of protection as the enclosure of the electric pump controller and automatic power transfer switch. The alternate (emergency) power digital annunciator interface shall numerically display:

- Normal power source individual phase to phase incoming voltage and frequency
- Alternate (emergency) power source individual phase to phase incoming voltage and frequency
- Transfer switch status text indication

The voltage and frequency readings of all three phases of both the normal and alternate (emergency) power and amperage readings shall be simultaneously and independently displayed with true RMS technology. Measurement of the voltage, frequency and amperage shall be accomplished with the latest technology to provide the most accurate readings. Electric pump controllers and automatic power transfer switches with analog meters and selector switches for the selection of the phase being displayed of either the voltage or current shall not be accepted.

Pump starts and elapsed pump run times shall only be considered if amperage is being drawn by the motor. Simple closure of the run contactor shall not be considered as the pump actually running nor should it count as pump elapsed run time.

The cut-in, cut-out and system pressure indication shall be continuously displayed. The ability to change the unit of measurement from Psi to Bar shall be provided through the adjustment of a dipswitch located inside the controller. Electric pump controllers and automatic power transfer switches without the capability of digitally displaying the cut-in, cut-out and system pressure shall not be accepted.

The normal power digital annunciator interface shall digitally indicate:

- Phase loss
- Phase unbalance
- Incoming over voltage
- Incoming under voltage
- Motor over current
- Motor under current
- Motor run
- Fail to start

The alternate (emergency) power digital annunciator interface shall digitally indicate:

- Normal power available
- Normal position
- Transfer in progress
- Generator start signal
- Alternate power available
- Alternate position
- Retransfer in progress
- Cooling time

Phase loss shall be indicated if the voltage of any phase drops below 85% of the nominal voltage. A separate phase unbalance indication shall be displayed if the difference of the minimum and maximum voltage is greater than 3% of the average voltage.

Incoming over voltage shall be indicated if any phases are greater than 110% of the nominal voltage of the controller and incoming under voltage shall be indicated if any of the phases are lower than 85% of the nominal voltage of the controller

Motor over current shall be indicated after 20 seconds if any of the current phases are greater than 130% of the nominal full load amperage of the electric motor and motor under current shall be indicated if any of the phases are lower than 30% of the nominal full load amperage of the electric motor.

A fail to start indication shall appear after 20 seconds of the motor run contactor being closed and the amperage drawn is lower than 5% of the electric motor full load amps

The normal power digital annunciator interface shall have high luminosity LED's for:

- Power available
- Phase reversal
- Pump on demand
- Weekly test

Electric pump controllers and automatic power transfer switches supplied with traditional neon or incandescent bulb pilot lights with coloured lens shall not be accepted.

The normal power digital annunciator interface shall have keypad type pushbuttons for:



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- Alarm reset
- Cut-in pressure setting
- Cut-out pressure setting
- Run test
- Print

The digital annunciator interface shall have a keypad type pushbutton for:

- Transfer switch bypass time delay
- Silence
- Alarm reset

The cut-in and cut-out adjustments shall have independent pushbuttons accessible without having to open the controller door which will raise the setting one unit (Psi or Bar) at a time and also raise the setting by 10 units if held pressed for more than one second. The logic of adjustment shall be so that the cut-out setting must be set before the cut-in setting and that the cut-in setting cannot be raised above the cut-out setting. The adjustment of the cut-out and cut-in shall be tamper proof through the setting of a dipswitch installed inside the controller.

PRESSURE AND EVENT RECORDING

The electric pump controller shall be equipped with a pressure and event recorder. The recorder will register and keep in memory general system information, pressure fluctuations over time that have occurred over the previous seven (7) days and events and alarms that have occurred over the previous fifteen (15) days. General system information, events and alarms include the following:

- Time and date of retrieval of data
- Cut-in and Cut-out setting
- Date of the last change of the cut-in and cut-out setting
- Date, time and pressure readings of the minimum and maximum pressure registered over the previous 7 days
- Weekly test information
- Minimum run period timer information
- Pump start time and date
- Pump stop time and date
- Pump on demand time and date
- Pump room alarm time and date
- Motor trouble time and date
- Power On date and time
- Power Off date and time

The information shall be retrievable through a USB slave communication port accessible without having to open the controller door.

PRESSURE SENSING DEVICE

The electric pump controller shall be supplied with a 304 stainless steel pressure transducer rated for fresh water operation between 0 and 300psi with $\pm 2\%$ accuracy and a minimum burst pressure of 420psi. The pressure transducer shall be used to display the pressure in the sprinkler system and also control the automatic start circuit. The pressure transducer shall be installed inside the controller directly mounted to a bulkhead allowing for an external connection to the sprinkler system sensing line. Controllers supplied with mechanical pressure sensing devices with or without mercury shall not be accepted.

FIELD ADJUSTMENTS AND OPERATION

The manual START and STOP control circuit of the electric pump controller shall not be electrically linked to the micro-processor. An anti-jogging system which shall prevent the manually rapid starting and stopping of the electric motor shall be supplied.

The electric pump controller shall ship from the factory set for manual stop and shall be field adjustable for automatic stop if required by adjusting a minimum run period timer. The minimum run period timer shall be accessed through the digital annunciator interface which shall display both a text indication and the remaining time of the timer.

A sequential start on delay timer shall be supplied and shall be field adjustable. The sequential start on delay timer shall be accessed through the digital annunciator interface and shall display the remaining time of the timer.

A weekly test timer shall be supplied as standard equipment. The timer shall allow for the setting of the date and start and stop times of the weekly test. This timer shall be field adjustable and accessed through the digital annunciator interface and shall display the remaining time of the timer.

A RUN TEST pushbutton shall be provided to electrically start the electric pump motor and hold it running automatically for 10 minutes. If the weekly test with solenoid valve option is requested, the RUN TEST pushbutton will energize the solenoid valve to create an artificial pressure drop which will be sensed by the pressure transducer starting the electric pump motor and hold it running for 10 minutes.

Voltage sensing on each phase of the normal power supply factory set at 85% to initiate actuation of the generator set start contact.



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Voltage and frequency sensing of the alternate (emergency) power source factory set at 90% to initiate transfer to alternate (emergency) power.

The voltage sensing on all phase of normal power factory set at 90% to initiate retransfer to normal power.

One timing function to override momentary normal outages before activating engine start contact factory set at 3 seconds.

One timing function to delay re-transfer to the normal power supply factory set at 5 minutes. Transfer to normal power shall be instantaneous in case of alternate power failure.

One timing function to allow engine generator cool down after retransfer to normal source factory set at 5 minutes.

Separate remote start and deluge valve start contacts shall be provided.

A field simulation phase reversal system shall be provided in order to verify this alarm condition. The correction of the phase reversal shall be accomplished by the adjustment of a dipswitch mounted inside the controller.

The ability of simultaneously verifying all inputs and outputs on the digital display screen shall be provided

ALARM CONTACTS FOR REMOTE INDICATION

Dry alarm contacts rate at 8A – 250VAC for remote indication shall be provided for the following conditions

- Power or phase failure and/or circuit breaker in open position (DPDT)
- Phase reversal (DPDT)
- Pump run (1N/O - 1N/C)
- Isolating switch in Off position (DPDT)
- Automatic transfer switch in normal power position (1 N/O)
- Automatic transfer switch in alternate power position (1 N/O)

OPTIONAL MODIFICATIONS

The electric pump controller shall be supplied with the following optional modifications:

- Flow switch provision
- Concentrate foam pump application
- Low suction pressure switch rated at 0-300psig for fresh water application
- Mounting feet
- Low suction pressure digital text indication
- Weekly exercise cycle alarm contacts
- Low ambient temperature digital text indication
- Low suction pressure alarm contacts
- Printer
- CE listing
- French labels
- Spanish labels
- Labels in other language other than English, French or Spanish
- Permanent load shedding contacts